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101ST CONGRESS
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SENATE

REPORT
101-386

SPARK M. MATSUNAGA HYDROGEN RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 1990

JULY 23 (legislative day, JULY 10), 1990.—Ordered to be printed

Mr. JOHNSTON, from the Committee on Energy and Natural Resources, submitted the following

REPORT

[To accompany H.R. 4521]

The Committee on Energy and Natural Resources, to which was referred the Act (H.R. 4521), to establish a hydrogen research and development program, having considered the same, reports favorably thereon with an amendment and an amendment to the title and recommends that the Act as amended, do pass.

The amendments are as follows:

1. Strike out all after the enacting clause and insert in lieu thereof the following:

SEC. 101. SHORT TITLE.

This Act may be referred to as the "Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990".

SEC. 102. FINDING, PURPOSES, AND DEFINITION.

(a) FINDING.—Congress finds that it is in the national interest to accelerate efforts to develop a domestic capability to economically produce hydrogen in quantities that will make a significant contribution toward reducing the Nation's dependence on conventional fuels.

(b) PURPOSES.—The purposes of this Act are—

(1) to direct the Secretary to prepare a comprehensive 5-year comprehensive program management plan that will identify and resolve critical technical issues necessary for the realization of a domestic capability to produce, distribute, and use hydrogen economically within the shortest time practicable;

(2) to direct the Secretary to develop a technology assessment and information transfer program among the Federal agencies and aerospace, transportation, energy, and other entities; and

(3) to develop renewable energy resources as a primary source of energy for the production of hydrogen,

(c) DEFINITION.—As used in this Act, the term:

(1) "critical technology" (or "critical technical issue") means a technology (or issue) that, in the opinion of the Secretary, requires understanding and develop-

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ment in order to take the next needed step in the development of hydrogen as an economic fuel or storage medium; and

(2) "Secretary" means the Secretary of Energy.

SEC. 103. COMPREHENSIVE MANAGEMENT PLAN.

(a) PLAN.—The Secretary shall prepare a comprehensive 5-year program management plan for research and development activities, which shall be conducted over a period of no less than 5 years and shall be consistent with the provisions of sections 104 and 105. In the preparation of such plan, the Secretary shall consult with the Administrator of the national Aeronautics and Space Administration, the Secretary of Transportation, the Hydrogen Technical Advisory Panel established under section 108, and the heads of such other Federal agencies and such public and private organizations as he deems appropriate. The plan shall be structured to identify and address areas of research critical to the realization of a domestic hydrogen production capability within the shortest time practicable.

(b) CONTENTS OF PLAN.—Within 180 days after the date of the enactment of this Act, the Secretary shall transmit the comprehensive program management plan to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate. Subsequent plans shall be incorporated in the management plan under this section. The plan shall include—

(1) a prioritization of research areas critical to the economic use of hydrogen as a fuel and energy storage medium;

(2) the program elements, management structure, and activities, including program responsibilities of individual agencies and individual institutional elements;

(3) the program strategies including technical milestones to be achieved toward specific goals during each fiscal year for all major activities and projects;

(4) the estimated costs of individual program items, including current as well as proposed funding levels for each of the 5 years of the plan for each of the participating agencies;

(5) a description of the methodology of coordination and technology transfer; and

(6) the proposed participation by industry and academia in the planning and implementation of the program.

(c) DEMONSTRATION PLAN.—The Secretary shall, in consultation with the Secretary of Transportation, the Administrator of the National Aeronautics and Space Administration, and the Hydrogen Technical Advisory Panel established under section 108, also prepare a comprehensive large-scale hydrogen demonstration plan with respect to demonstrations carried out pursuant to section 105. Subsequent plans shall be incorporated in the management plan under this section. Such plan shall include—

(1) a description of the necessary research and development activities that must be completed before initiation of a large-scale hydrogen production and storage demonstration program;

(2) an assessment of the appropriateness of a large-scale demonstration immediately upon completion of the necessary research and development activities;

(3) an implementation schedule with associated budget and program management resource requirements; and

(4) a description of the role of the private sector in carrying out the demonstration program.

SEC. 104. RESEARCH AND DEVELOPMENT.

(a) PROGRAM.—The Secretary shall conduct a research and development program, consistent with the comprehensive 5-year program management plan under section 103, to ensure the development of a domestic hydrogen fuel production capability within the shortest time practicable consistent with market conditions.

(b) RESEARCH.—(1) Particular attention shall be given to developing an understanding and resolution of all critical technical issues preventing the introduction of hydrogen into the marketplace.

(2) The Secretary shall initiate research or accelerate existing research in critical technical issues that will contribute to the development of more economic hydrogen production and use, including, but not limited to, critical technical issues with respect to production, liquefaction, transmission, distribution, storage, and use (including use of hydrogen in surface transportation).

(c) RENEWABLE ENERGY PRIORITY.—The Secretary shall give priority to those production techniques that use renewable energy resources as their primary source of energy for hydrogen production.

(d) NEW TECHNOLOGIES.—The Secretary shall, for the purpose of performing his responsibilities pursuant to this Act, solicit proposals for and evaluate any reasonable new or improved technology that could lead or contribute to the development of economic hydrogen production storage and utilization.

(e) INFORMATION.—The Secretary shall conduct evaluations, arrange for tests and demonstrations, and disseminate to developers information, data, and materials necessary to support efforts undertaken pursuant to this section, consistent with section 106.

SEC. 105. DEMONSTRATIONS.

(a) REQUIREMENT.—The Secretary shall conduct demonstrations of critical technologies, preferably in self-contained locations, so that technical and non-technical parameters can be evaluated to best determine commercial applicability of the technology.

(b) SMALL-SCALE DEMONSTRATIONS.—Concurrently with activities conducted pursuant to section 104, the Secretary shall conduct small-scale demonstrations of hydrogen technology at self-contained sites.

SEC. 106. TECHNOLOGY TRANSFER PROGRAM.

(a) PROGRAM.—The Secretary shall conduct a program designed to accelerate wider application of hydrogen production, storage, utilization, and other technologies available in near term as a result of aerospace experience as well as other research progress by transferring critical technologies to the private sector. The Secretary shall direct the program with the advice and assistance of the Hydrogen Technical Advisory Panel established under section 108. The objective in seeking this advice is to increase participation of private industry in the demonstration of near commercial applications through cooperative research and development arrangements, joint ventures or other appropriate arrangements involving the private sector.

(b) INFORMATION.—The Secretary, in carrying out the program authorized by subsection (a), shall—

(1) undertake an inventory and assessment of hydrogen technologies and their commercial capability to economically produce, store, or utilize hydrogen in aerospace, transportation, electric utilities, petrochemical, chemical, merchant hydrogen, and other industrial sectors; and

(2) develop a National Aeronautics Space Administration, Department of Energy, and industry information exchange program to improve technology transfer for—

(A) application of aerospace experience by industry;

(B) application of research progress by industry and aerospace;

(C) application of commercial capability of industry by aerospace; and

(D) expression of industrial needs to research organizations.

The information exchange program may consist of workshops, publications, conferences, and a data base for the use by the public and private sectors.

SEC. 107. COORDINATON AND CONSULTATION.

(a) SECRETARY'S RESPONSIBILITY.—The Secretary shall have overall management responsibility for carrying out programs under this Act. In carrying out such programs, the Secretary, consistent with such overall management responsibility—

(1) shall use the expertise of the National Aeronautics and Space Administration and the Department of Transportation; and

(2) may use the expertise of any other Federal agency in accordance with subsection (b) in carrying out any activities under this title, to the extent that the Secretary determines that any such agency has capabilities which would allow such agency to contribute to the purpose of this Act.

(b) ASSISTANCE.—The Secretary may, in accordance with subsection (a), obtain the assistance of any department, agency, or instrumentality of the Executive branch of the Federal Government upon written request, on a reimbursable basis or otherwise and with the consent of such department, agency, or instrumentality. Each such request shall identify the assistance the Secretary deems necessary to carry out any duty under this Act.

(c) CONSULTATION.—The Secretary shall consult with the Administrator of the National Aeronautics and Space Administration, the Administrator of the Environmental Protection Agency, the Secretary of Transportation, and the Hydrogen Tech-

nical Advisory Panel established under section 108 in carrying out his authorities pursuant to this Act.

SEC. 108. TECHNICAL PANEL.

(a) ESTABLISHMENT.—There is hereby established the Hydrogen Technical Advisory Panel (the "technical panel"), to advise the Secretary on the programs under this Act.

(b) MEMBERSHIP.—The technical panel shall be appointed by the Secretary and shall be comprised of such representatives from domestic industry, universities, professional societies, Government laboratories, financial, environmental, and other organizations as the Secretary deems appropriate based on his assessment of the technical and other qualifications of such representatives. Appointments to the technical panel shall be made within 90 days after the enactment of this Act. The technical panel shall have a chairman, who shall be elected by the members from among their number.

(c) COOPERATION.—The heads of the departments, agencies, and instrumentalities of the Executive branch of the Federal Government shall cooperate with the technical panel in carrying out the requirements of this section and shall furnish to the technical panel such information as the technical panel deems necessary to carry out this section.

(d) REVIEW.—The technical panel shall review and make any necessary recommendations to the Secretary on the following items—

(1) the implementation and conduct of programs under this Act;

(2) the economic, technological, and environmental consequences of the deployment of hydrogen production and use systems; and

(3) comments on and recommendations for improvements in the comprehensive 5-year program management plan required under section 103.

(e) SUPPORT.—The Secretary shall provide such staff, funds and other support as may be necessary to enable the technical panel to carry out the functions described in this section.

SEC. 109. AUTHORIZATION OF APPROPRIATIONS.

There is hereby authorized to be appropriated to carry out the purposes of this Act (in addition to any amounts made available for such purposes pursuant to other Acts)—

(1) $3,000,000 for the fiscal year 1992;

(2) $7,000,000 for the fiscal year 1993;

(3) $10,000,000 for the fiscal year 1994.

Amend the title to read as follows: "Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Program Act of 1990.".

PURPOSE OF THE MEASURE

The purpose of this measure is to direct the Secretary of Energy to accelerate efforts to develop a domestic capability to produce hydrogen in quantities that make a significant contribution toward reducing the Nation's dependence on conventional fuels.

BACKGROUND AND NEED

Hydrogen is fuel and potential energy storage medium, not a primary energy source. Hydrogen must be extracted from other naturally occurring resources containing elemental hydrogen, such as methane or water, through the addition of an available source of energy.

Today hydrogen is produced through steam reforming of natural gas and petroleum and through the electrolysis of water. The production cost for steam reforming is estimated by the Department of Energy at $6 to $11 per million BTU, depending on the cost of natural gas and characteristics of the production facility.

The cost of hydrogen produced through electrolysis of water varies widely with the cost of electricity and the size of the produc-

tion facility. At 6 cents per kilowatt hour direct current and 85 percent electrolyzed efficiency (a DOE goal), the cost of electrolytic hydrogen is estimated by DOE to be $22 per million BTU. A fuel cost of $10 per million BTU equates to gasoline at $2 per gallon.

Hydrogen storage and transportation costs are also high. Hydrogen can diffuse through ordinary containers and causes embrittlement in metals that could significantly affect storage containers and pipelines in a hydrogen distribution system.

Despite cost disadvantages, hydrogen is the preferred fuel for the space program because of its light weight. The energy stored in hydrogen per pound of weight is highest of any combustible fuel. Combustion of hydrogen in air yields water and very low levels of nitrogen oxides. End use of hydrogen produces negligible amounts of greenhouse gases, no sulfur oxides and no smog. Once the hydrogen is produced, its use as an energy source is environmentally benign.

However, the only widespread use of hydrogen as a fuel occurs in the space program where there are no practical alternatives available. For other than space applications, the lower cost and convenience of other available fuels overwhelms any advantages of hydrogen.

Hydrogen has a very important potential role as a energy storage medium. A fundamental difficulty with renewable sources of electricity is the uncontrolled, intermittent nature of the resource and our current inability to store electricity effectively once it is generated. For example, solar energy can be produced with any efficiency only during certain daylight hours and then only when the sky is clear. Hydroelectric energy can be produced at times of high water flow, but these times do not necessarily coincide with times of high demand for electricity.

An important potential application of hydrogen is as an energy storage medium for electricity produced from intermittent sources or during off-peak demand periods. For example, excess supplies of electricity from photovoltaic arrays or spill hydroelectric energy could be used to electrolyze water to produce hydrogen. The energy stored in hydrogen could then be consumed at a later time.

The potential for economic use of energy stored in hydrogen emerges only at this last stage. However, generation costs for solar electricity are still relatively high. The specialized infrastructure needed for widespread use of hydrogen does not exist. Low electrolysis efficiencies limit the economic feasibility of conversion of conventional electricity supplies into hydrogen. Reconversion efficiencies further reduce the yield of energy eventually recovered at the end of the process. These effects combine to render energy storage in the form of hydrogen uneconomic at the present time.

Clearly a key early factor in the design of a cost effective hydrogen energy supply system is the cost of producing hydrogen. A plentiful and low cost source of electricity is an essential, but not presently available, prerequisite of economic use of hydrogen as an energy storage medium. Pending the development of lower cost electricity sources, the most important factor in the critical path to a capability for hydrogen use is to reduce the production cost of hydrogen itself. This cost dominates the economics of an energy system that attempts to produce significant quantities of hydrogen

from renewable energy resources. The deployment of technologies for hydrogen end use will remain infeasible until the cost of producing hydrogen is reduced significantly.

The Department of Energy presently carries out research and development on hydrogen as an energy medium under numerous line items in its budget, including Renewable Energy, but also including Weapons Testing, Fusion Energy, and Basic Energy Sciences. What is needed is a consolidated and determined effort to concentrate technical and financial resources on the critical factors that can reduce the cost of producing hydrogen. Until the production cost of hydrogen is reduced, so that there can be widespread use of hydrogen as a fuel or energy storage medium, consumers will be denied the benefits of hydrogen, especially its environmental benefits. The bill thus supports a strong federal research, development and demonstration program to develop cost effective hydrogen production technologies.

LEGISLATIVE HISTORY

H.R. 4521 was introduced on April 18, 1990 in the House of Representatives. The bill was based on H.R. 2793, which was introduced on June 29, 1989. H.R. 4521 passed the House on May 8, 1990. On May 9, H.R. 4521 was received in the Senate and referred to the Committee on Energy and Natural Resources.

Senator Matsunaga introduced S. 639 on March 16, 1989. S. 639 contained provisions similar to those of H.R. 2793. Original cosponsors were Senators Inouye, Wirth, Pell, and Lieberman. Subsequently, Senator Boschwitz was added as a cosponsor. A similar bill S. 1296, was introduced by Senator Matsunaga in the 100th Congress and referred to the Committee on Energy and Natural Resources.

The Subcommittee on Energy Research and Development held a hearing on S. 639 on March 30, 1990 (Senate Hearing 101-596).

At the business meeting on June 20, 1990, the Senate Committee on Energy and Natural Resources ordered the text of S. 639, as amended, favorably reported as a substitute for H.R. 4521. Identical language was included in S. 324 reported by the Committee on May 16, 1990.

COMMITTEE RECOMMENDATIONS AND TABULATION OF VOTES

The Senate Committee on Energy and Natural Resources, in open business session on June 20, 1990, by a majority vote of a quorum present, recommends that the Senate pass H.R. 4521 if amended as described herein.

The rollcall vote on reporting the measure was 19 yeas, no nays, as follows:

YEAS	NAYS
Mr. Johnston	
Mr. Bumpers	
Mr. Ford	
Mr. Bradley*	
Mr. Bingaman*	
Mr. Wirth	
Mr. Conrad*	

Mr. Heflin*
Mr. Rockefeller*
Mr. Akaka
Mr. McClure
Mr. Hatfield*
Mr. Domenici
Mr. Wallop*
Mr. Murkowski
Mr. Nickles
Mr. Burns
Mr. Garn*
Mr. McConnell

*Indicates voted by proxy.

COMMITTEE AMENDMENTS

The bill ordered reported is a substitute for the version of H.R. 4521 passed by the House of Representatives. The reported bill contains provisions establishing a research, development and demonstration program in the Department of Energy to address critical technologies and issues in hydrogen production. The reported bill does not include the provisions of titles II or III of H.R. 4521 as approved by the House of Representatives.

Title II provided for a program to be administered by the National Aeronautics and Space Administration for the development of a domestic hydrogen-fueled aircraft capability. These latter provisions are contained in a separate bill, S 2613, that has been referred to the Committee on Commerce, Science and Transportation.

Title III of H.R. 4521 provides for priority to domestic firms in the awarding of contracts under the Act if certain criteria are met. The reported bill does not contain this provision.

The Committee amended the title of the bill so that the bill may be cited as the "Spark M. Matsunaga Hydrogen Research and Development Act of 1990".

SECTION-BY-SECTION ANALYSIS

Section 321. Short title

Section 321 names this Act the "Spark M. Matsunaga Hydrogen Research and Development Act of 1990".

Section 322. Purpose and definition

Section 322 contains the purposes of the Act and defines the term "critical technology" (and "critical technical issue"). Critical technologies would be identified by the Secretary of Energy. These are the technologies that stand directly in the path of the development of hydrogen as an economic fuel or storage medium. In concentrating research efforts on critical technologies, the Secretary is putting emphasis on the most important obstacles to developing an economic hydrogen production capability.

Section 323. Comprehensive management plan

Section 323 directs the Secretary to prepare a 5-year program management plan for hydrogen research and development activities. The Secretary is required to consult with the Administrator of

the National Aeronautics and Space Administration, the Secretary of Transportation, and several other entities in the development of this plan. Among other matters, the management plan would identify and set priorities for critical research areas and state the milestones to be achieved in each of the 5 years covered.

The plan is to serve as a statement of the strategy that is being followed in the development of hydrogen as an economic fuel and energy storage medium. Strategies must be flexible and responsive to pressures and opportunities. Therefore the plan would be subject to amendment as needed. The original plan must be transmitted to the Committee on Science, Space, and Technology of the House of Representatives and to the Committee on Energy and Natural Resources of the Senate within 180 days after date of the enactment of the Act. Subsequent amendments to the plan should also be transmitted to these Committees.

Subsection (c) requires the development of a separate largescale hydrogen demonstration plan. This plan would describe the research and development activities that must be completed before initiation of a large-scale hydrogen production and storage program and assess the appropriateness of such demonstrations immediately upon completion of these activities. The plan must also contain a schedule with associated budget and program resource requirements for any demonstrations recommended.

Section 324. Research and development

Section 324 requires the Secretary to conduct a program of research and development consistent with the management plan. The section directs the Secretary to give particular attention to critical technical issues, the resolution of which will contribute significantly to the development of a capability for more economic hydrogen production and use. The Secretary is required to give priority to hydrogen production techniques that use renewable energy resources as a primary source of energy for hydrogen production.

The Committee recognizes that there have been studies performed by the Bonneville Power Administration regarding hydrogen production from spill hydroelectric energy. The Committee encourages the Department to conduct further activities to determine the feasibility and economics of producing hydrogen from excess central-station electricity and to direct funds and support to BPA's efforts in this area.

Section 325. Demonstrations

Section 325 directs the Secretary to conduct demonstrations of critical technologies to permit evaluation of technical and non-technical parameters affecting commercial applicability. The Secretary is also required to conduct small-scale demonstrations of hydrogen production technology in connection with research and development activities under section 324.

Section 326. Technology transfer program

Section 326 requires the Secretary to conduct a program to encourage transfer of hydrogen production, storage, utilization, and other technologies to the private sector. The Secretary must make use of the advice and assistance of the Hydrogen Technical Panel

under section 328 in managing the technology transfer program. Under this program the Secretary would undertake an inventory and assessment of hydrogen technologies and their commercial applicability and develop a program to exchange information among industry, the National Aeronautics and Space Administration, and the Department of Energy.

Section 327. Coordination and consultation

Section 327 provides that the Secretary shall have overall management responsibility for the programs under this Act. The secretary may use the expertise of the National Aeronautics and Space Administration, the Department of Transportation, and any other Federal agency in carrying out activities under the Act and may obtain assistance on a reimbursable basis from any department, agency, or instrumentality of the Federal Government.

The Secretary must consult with the Administrator of the National Aeronautics and Space Administration, the Administrator of the Environmental Protection Agency, the Secretary of Transportation, and the Hydrogen Technical Advisory Panel under section 328 in carrying out this Act.

Section 328. Technical panel

Section 328 establishes a Hydrogen Technical Advisory Panel to advise the Secretary on the programs under this Act. The panel would be appointed by the Secretary and would review and make recommendations to the Secretary on the program under this Act.

Section 329. Authorizations

Section 329 authorizes a total of $20 million to carry out the purposes of the Act as follows:

$3 million for fiscal year 1992;
$7 million for fiscal year 1993; and
$10 million for fiscal year 1994.

These amounts are authorized to be appropriated in addition to any amounts that may be authorized to be appropriated for hydrogen research, development and demonstration under other Acts.

COST BUDGETARY CONSIDERATIONS

The following estimate of the cost of this measure has been provided by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, June 25, 1990.

Hon. J. BENNETT JOHNSTON, Jr.,
Chairman, Committee on Energy and Natural Resources,
U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 4521, the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ROBERT D. REISCHAUER.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 4521

2. Bill title: Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990.

3. Bill status: As ordered reported by the Senate Committee on Energy and Natural Resources, June 20, 1990.

4. Bill purpose: The bill would require the Department of Energy (DOE) to research, develop, and demonstrate technology for the use of hydrogen as a fuel, particularly for the transportation sector. DOE, in consultation with the National Aeronautics and Space Administration (NASA) and a Hydrogen Technical Advisory Panel, would prepare a five-year program management plan for hydrogen research and development, conduct demonstrations of hydrogen production technologies, and provide technology transfer support to accelerate market acceptability of hydrogen as a fuel.

5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1991	1992	1993	1994	1995
Estimated authorization	0.1	3.0	7.0	10.0	.....
Estimated outlays	.1	1.5	4.6	7.9	4.6

The costs of this bill fall within budget functions 250 and 270.

Basis of estimate: The bill would authorize funding of $3 million, $7 million, and $10 million for fiscal years 1992, 1993, and 1994, respectively. In addition, CBO estimates that completing the management plan required by Section 103 of the bill would cost about $100,000 in fiscal year 1991.

For the purpose of this estimate, CBO assumes that all amounts authorized will be appropriated and that spending will occur at historical rates for similar research and development programs.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: On June 25, 1990, CBO prepared a cost estimate for S. 639, as ordered reported by the Senate Committee on Energy and Natural Resources on June 20, 1990. S. 639 is identical to H.R. 4521; hence, the costs of these two bills are the same.

On June 15, 1990, CBO prepared a cost estimate for S. 324, the National Energy Policy Act of 1990, as ordered by the Senate Committee on Energy and Natural Resources on May 16, 1990. S. 324 also would authorize a three-year total of $20 million for hydrogen research and development, but S. 324 would authorize these sums for fiscal years 1993 through 1995 instead of 1992 through 1994.

On April 24, 1990, CBO prepared a cost estimate for H.R. 2793, the Matsunaga Hydrogen Research and Development Act, as or-

dered reported by the House Committee on Science, Space, and Technology on April 18, 1990. H.R. 2793 would authorize $50 million for hydrogen research and development, of which $15 million was previously authorized by the Renewable Energy and Energy Technology Competitiveness Act of 1989 (42 U.S.C. 12004). In addition, H.R. 2793 would authorize $100 million over the 1991–1995 period for spending by NASA for research and development on hydrogen-fueled aircraft.

9. Estimate prepared by: Pete Fontaine.

10. Estimate approved by: C.G. Nuckols for James L. Blum, Assistant Director for Budget Analysis.

REGULATORY IMPACT EVALUATION

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee makes the following evaluation of the regulatory impact which would be incurred in carrying out the bill as reported. H.R. 4521 is not a regulatory measure in the sense of imposing Government-established standards or significant economic responsibilities on private individuals and businesses. The bill establishes a program of research, development, and demonstration for hydrogen production and use technologies. Participation in these programs by private entities is voluntary.

No personal information would be collected in administering the program. Therefore, there would be no impact of personal privacy.

Little additional paperwork would result from the enactment of H.R. 4521, as reported. No additional paperwork would be required of anyone not choosing to participate in the program.

EXECUTIVE COMMUNICATIONS

No legislative reports were requested or received by the Committee setting forth executive agency recommendations relating to H.R. 4521.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee notes that no changes in existing law are made by the bill H.R. 4521, as reported.

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